POWER SUPPLY

Type PS-8 Model S-1305A

Ratelco, INC.

610 Pontius Avenue N. • Seattle, Washington 98109

Phone 206-624-7770

ELECTRONICS MANUFACTURERS

Alternator Power Converters • Power Supplies • Automatic Battery Chargers

Industrial Transistor Amplifiers

Antennas • Communications Accessories • Marine Products

PRELIMINARY INSTRUCTION SHEETS

PORTABLE POWER SUPPLIES

MODEL TABLE

MODEL	SUFFIX	DESCRIPTION
S1303A		Unit with 1-18 V DC OUTPUT
S1305A		Unit with 1-18 or 1-40 V DC OUTPUT

1. INTRODUCTION

These S1303A and S1305A power supplies are used for testing transistorized mobile and portable two-way radios with primary current requirements of up to 40 amperes. These units have voltage regulation and current-limiting circuitry up to 40 amps. They are equipped with removable control units containing volt and current meters. The control unit can be mounted separately from the main power source by using a Model SKN6015A Remote Cable Kit. In addition, a SLN6317A Rack-Mount Kit allows mounting of the power supply in a 19 inch rack cabinet.

These units may be used to simulate actual operating conditions by applying slightly higher or lower than recommended operating voltages. This procedure may serve as an aid in locating intermittent faults.

2. DESCRIPTION

The models S1303A and S1305A are continously variable power supplies. The model S1303A will supply operating power to radios requiring a DC input of 1-18 volts and the Model S1305A will supply operating power to radios requiring 1-40 volts DC input. In both models the current is limited to 20 amps continuous and 40 amps intermittent (maximum 1 minute in five minute intervals) with the output voltage between 1 and 15 volts. Above 15 volts the current must be limited as shown in the diagram on the front panel to provide a maximum power output of 300 watts continous or 600 watts intermittent. With the Model S1305A at high current outputs (over 20 amps) the low voltage range should be used whenever the output voltage is less than 18 volts.

The ripple content is low enough to be used with any mobile radio. These power supplies contain a standby ON switch that allows turning off the output voltage without turning off the entire unit. It is advisable to use the standby mode for prolonged use of the unit. The switch at the lower left hand corner is used to turn off the unit and the fan. This switch is also used in the Model S1305A to select 1-18 volts or 1-40 volts output.

3. OPERATION

a. Voltage Control

When testing a radio, turn STANDBY-ON switch to the ON position and set the voltage control switch to the desired output. When test is completed, return the switch to the STANDBY position.

b. Current Limiter Control

This control is used to limit the current to the radio under test. The unit will hold the current output to within one ampere of the desired level. The current limiting level is set by turning the current limiting control in a counter-clockwise direction until the voltage starts to fall. (as indicated on the panel voltmeter) If the mobile radio under test exceeds the preset current level, the voltage will drop automatically limiting the current output to the preset value.

c. Transistor Protection Circuitry

The power supplies have a protection circuit which turns the output off in case of a short circuit in the series regulator. This will protect the device under test from over voltage damage. This circuit also restricts the 1-18 volt range on the Model S1305A to 20 volts maximum. If an attempt is made to advance the voltage control beyond 20 volts in the low range or if the unit is switched from the high range to the low range while the output is greater than 20 volts the output will go to zero.

To restore operation reduce the voltage control setting to less than 18 volts and then switch the unit off and back on.

4. INSTALLATION

a. Place power supply in any convenient location that does not obstruct the air vents.

b. Connect the power cord to a 110-120 volt AC source.

c. Connect the equipment to be powered to the DC receptacles on the front panel with heavy wire. Number 10 is the minimum recommended wire size for most applications. NOTE: Be sure of proper polarity when making connections to the equipment (RED-POSITIVE, BLACK-NEGATIVE).

5. GUARANTEED PERFORMANCE SPECIFICATIONS

MODELS	S1303A	S1305A
DC OUTPUT	1-18 V DC	1-18 V DC or 1-40 V DC
METERING ACCURACY	± 2% full scale	
CURRENT CAPACITY	20 amps continuous 40 amps intermittent at 1-15 volts DC	
	300 watts continuous 600 watts intermittent over 15 volts DC	
RIPPLE CONTENT	10 millivolts nominal in continuous range	
INPUT VOLTAGE	117 V AC ± 10% 60 Hz	
REGULATION	± 15 mV in continuous range, ± 1% + 40 mV in intermittent range	
OVERALL DIMENSIONS	13½" High, 8" Wide, 15" Deep	
WEIGHT	41 lbs net	

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

6. DATA INCLUDED

Model S1303A Portable Power Supply Schematic Diagram 63D81059A36

Model S1305A Portable Power Supply Schematic Diagram 63D81059A37

Trouble Shooting Guide Model S1303A and S1305A

NOTE:

Unless otherwise indicated all voltages are given with the voltmeter common lead connected to the positive DC output. (The resistance of the meter should be at least 20,000 /v) All test points are shown either on the schematic or drawing 2150A.

1.1 NO DC OUTPUT

Cycle the on-off switch, if this has not started the unit check the AC input line and fuse. If the line voltage is correct and the fuse intact remove the left-hand side panel. Measure the voltage from the pass-transistor heat sink to the positive DC output.

1.1.1 If the voltage is over 7.0 volts go to 2.

1.1.2 If the voltage is less than 7.0 volts go to 3.

NOTE

Inside of the power supply there are four (4) heat sinks mounted in the form of a box with the ends at the front and rear of the power supply. The fan and one SCR are mounted on the bottom heat sink, the 2N3055 pass-transistors and the 2N3055 drive transistor are located on the two side heat sinks, and the other SCR is mounted on the top heat sink. These heat sinks are at different electrical potentials and are insulated from each other and the chassis.

1.2 HIGH MINIMUM DC CUTPUT VOLTAGE

Check the bleeder lamp for loosening in the socket or an open circuit.

WARNING

The fuseholder has 117 VAC applied even with the power switch off. Unplug the power supply to prevent shock hazard when working near the fuseholder.

1.2.1 If the bleeder lamp is good go to 2.

1.3 REDUCED CURRENT OUTPUT CAPACITY

With a 5 to 20 amp load at any convenient voltage measure the emitter voltage at each of the pass transistors (TP22 - TP25). The emitter pin is the pin with a bare connecting wire to it from the terminal strip. The four emitter voltages should read within 50 mv of each other. If not, replace the transistor(s) with low voltage at the emitter. The transistors may be isolated by removing the base and emitter lead connections and then tested in place to insure that the transistor is bad. The transistors are installed by the manufacturer in matched sets so to be sure of optimum performance the transistor should be replaced by requesting a transistor (from Ratelco, Inc.) with a number the same as is written on the bad transistor.

1.3.1 If no bad transistor is found or upon replacement of a bad transistor go to 5.

1.3.2 If no discrepancy exists in the meter adjustment go to 2.

1.4 POOR REGULATION

With the voltage control turned down check the voltage across the pass transistors (TP26).

1.4.1 If greater than 10 volts go to 2., if 2. checks good go to 6.

1.4.2 If less than 10 volts go to 3.

1.5 EXCESSIVE RIPPLE

When the output current is being limited by the current limiter the ripple content of the output will increase. If the current limiter is not in operation and there is greater than 10 mV ripple RMS in the output, measure the voltage across the pass-transistors with the load connected.

1.5.1 If the voltage across the pass-transistors is greater than 9.0 volts go to 2.

1.5.2 If the voltage across the pass-transistors is less than 9.0 volts go to 3.

1.6 AC INPUT FUSE BLOWS WHENEVER THE UNIT IS TURNED ON

Check SCR's for short circuit. If SCR(s) shorted replace SCR(s) and pulse transformer (-2). Also check unijunction transistor for defect.

2. REGULATOR CIRCUIT

2.1 Check voltage at TP4 on the circuit board. If greater than 18 volts go to paragraph 2.2.

Disconnect either end of the zener diode (-11) and measure the voltage at TP4 again. If voltage is greater than 18 volts, replace the zener. If voltage is less than 18 volts reconnect the zener and disconnect either end of 200 mfd capacitor (-15B) and measure voltage again, if voltage decreases replace the integrated circuit. If the voltage does not change replace the capacitor.

2.2 Place standby switch in standby and rotate the voltage control knob to the extreme counter-clockwise position. Make the following voltage checks:

2.2.1 TP8, TP9: TP9 okay if less than 3.0 volts, TP8 okay if less than 0.1 volts. If TP8 is less than 0.5 volts and TP9 is over 5.0 volts replace integrated circuit.

If TP8 is greater than 0.5 volts disconnect 10 volt zener (-10) at TP9 and measure TP8 again. If TP8 is greater than 0.5 volts replace the 2N4922: If less than 0.5 volts replace the 10 volt zener. If not greater than 1.00 volts the most noticable effect will be a high minimum output voltage (greater than 1.2 volts without load).

2.2.2 TP11 and TP16 should be approximately 3.3 volts. With the standby switch out of standby and the output voltage greater than 2.0 volts there should be less than 0.01 volts difference between TP16 and TP11. If TP16 has a higher voltage than TP11 then TP9 should be less than 3.0 volts, if not replace the integrated circuit. If TP11 is greater than TP16, TP9 should be greater than 10 volts, if not disconnect the 10 volt zener at TP8 and measure TP9. If TP9 is greater than 10 volts replace the zener diode (-10). If TP9 is less than 10 volts and TP11 is still greater than TP16 replace the integrated circuit.

2.2.3 TP15 is OK if greater than 6.0 volts.

If less than 6.0 volts check connector #2 pin #11 for less than 3.0 volts difference with TP15; If less than 3.0 volts difference replace the integrated circuit, if more check trimmer (-36C) and 1 mfd capacitor (-68B) for defect.

2.2.4 TP7: This is the current limiter and during current limiting the voltage should be greater than 0.60 volts. If this voltage is greater than 0.60 volts and there is no current limiting with the current limiter turned full counter-clockwise ckeck TP5, if less than 5.3 volts replace 5.6 volt zener (-71). If greater than 5.3 volts go to 4. If TP7 is less than 0.50 volts and the current is limited replace the integrated circuit.

2.2.5 TP17, TP18: Check the voltage between TP17 and TP18. If there is more than 0.1 volt difference and the output voltage is greater than 2.0 volts repeat the checks under 2.2.1, if this checks good replace the integrated circuit.

3. FIRING CIRCUIT

3.1 Position standby switch in the UP position, current limiter to the extreme clockwise (40 amp) position and the voltage control knob to 1 volt.

3.1.1 Measure voltage at TP20. If less than 19 volts disconnect the anode end of the 24 volt zener (-12) and check voltage again. If greater than 19 volts replace zener diode (-12), if less than 19 volts check TP3. If TP3 greater than 30 volts go to 6. If TP3 less than 30 volts check (-3) diodes for defect and line voltage greater than 108 VAC.

Measure voltage between pass-transistor heat sink (TP26) and positive DC output, if voltage at TP26 is greater than 5.0 volts go to 6.

3.1.2 If voltage at TP26 is less than 5.0 volts put on oscilloscope across the 15 ohm resistor in the gate circuit of the SCR. Turn the unit off and then back on to see if there is a gate pulse to the SCR at the instant the unit is turned on. To fire the SCR a pulse of greater than 3.0 volts is required. If the pulse is less than 3.0 volts replace the unijunction transistor (-9). If there is no pulse, check TP21 with the scope probe for wave form as given in Fig. 1e. If the voltage at TP26 is close to zero the wave form at TP21 will consist of only 3 or 4 pulses each time the unit is turned on. In order to fire the SCR these pulses should be at least 12 volts. If the pulses are less than 12 volts replace -9 unijunction transistor and check the -6A and -6B transistors for defect.

3.1.3 If pulse at gate exceeds 3.0 volts but SCR does not fire replace SCR's. If there is a pulse at TP21 but none at the SCR gate check the lead from connector #1 pin #9 to gate for continuity, if OK replace pulse transformer (-2).

4. CURRENT LIMITER

4.1 Check TP5 for 5.6 volts. If less than 5.3 volts replace 5.6 volt zener (-71).

4.2 With current limiter knob turned fully clockwise and no load on unit check TP6, if less than 0.5 volts go to 2. If greater than 0.5 volts check TP14, if TP14 greater than 2.0 volts replace 2N3394 (-6D). If TP14 less than 2.0 volts check TP13, if greater than 0.6 volts go to 6. If less than 0.6 volts replace 2N3394 (-6C).

4.3 With current limiter knob turned to 0 amps check TP6, if greater than 0.6 volts go to 2. If less than 0.6 volts check TP14. If TP14 less than 0.6 volts replace 2N3394 (-6D). If greater than 0.6 volts check TP13; If TP13 less than 0.6 volts go to 6. If greater than 0.6 volts replace 2N3394 (-6C).

4.4 If all voltages check out correctly and the current limiter does not operate, replace (-74) 680 ohm resistor with a 820 ohm resistor. If this does not cure the current limiter problem replace the integrated circuit.

5. AMMETER ADJUSTMENT

5.1 For best results 2 ammeters are necessary, 0-40 amp and 0-4 amp meters. The adjustment trimmer for the power supply ammeter is mounted on the circuit board attached to the rear of the voltmeter in the control head. There are two trimmers in the model S1305A; one for the ammeter and one for the 1-40 volt range of the voltmeter. The model S1303A has only the ammeter adjustment trimmer. Draw any convenient current and adjust the current trimmer so that the internal and external ammeters agree. The 0-4 amp range is adjusted by changing the length of the nichrome wire between the small and large DC positive jacks. After adjusting the power supply ammeter connect a load drawing up to 4 amps and adjust the length of the nichrome wire resistor until the internal and external ammeters agree.

WARNING

The fuse holder has 117 VAC on it even with the power switch in the off position. To prevent shock hazard remove the line cord from the socket before attempting to adjust the nichrome wire resistor. Also make absolutely certain that the nichrome wire has at least ½" clearance around it.

6. CIRCUIT BOARD ADJUSTMENT

Normally readjustment of the circuit board trimmers would be required only after replacing a defective component.

CAUTION

Extreme maladjustment of the circuit board trimmers may cause damage to the power supply. For this reason breaking the factory seals on the trimmers may in some cases void the warranty.

6.1 Trimmers (-36A) and (-37B) are used to adjust the firing circuit. The voltage at TP26 is controlled by trimmer (-36A) and the firing angle is controlled by trimmer (-36B).

6.1.1 Monitor TP26. (Pass-transistor heatsink to positive DC output) with a voltmeter and connect an oscilloscope between positive DC output and TP3. The voltage at TP26 should not exceed 10.5 volts when the SCR's are firing. It may be noted that there are excursions of voltage above 15 volts at times but at these times the SCR's should have ceased firing and the voltage will drift down until the SCR's fire.

6.1.2 Remove all load from the unit and turn the voltage control knob to its extreme counter-clockwise position. By incrementally adjusting trimmers (-36A) and (-36B) the voltmeter should fluctuate between 10.5 and 11.5 volts. The oscilloscope wave form will appear as in Fig. 1a, possibly with only 2 or 3 firings per second. If the wave form appears as in Fig. 1b there will be poor regulation at 14-18 volt and 40 amp output. For a more precise adjustment the unit must be returned to the manufacturer.

6.2 VOLTAGE ADJUSTMENT:

6.2.1 The output voltage range is adjusted with trimmers (-36C) and (-36E). The upper voltage limit adjustment is made using (-36C) and the lower voltage limit adjustment is made using trimmer (-36E). These adjustments interact and a proper adjustment requires several repetitions of the adjustment proceedure.

6.2.2 By using an accurate voltmeter and a 115V, 40-200 watt light bulb across the small output jacks the output voltage range is adjusted as follows:

Model S1303A

Adjust the lower limit by centering trimmer (-36E) in the middle of its range. The upper voltage limit is set at 18.5 volts by adjusting trimmer (-36C).

Model S1305A

Position the voltage range switch in the 1-40 volt range. The lower limit is set at 0.5 volts using trimmer (-36E), the upper limit is set at 40.5 volts using trimmer (-36C).

In the control head there is a trimmer (-36F) which adjusts the 1-40 volt scale on the voltmeter. Set the output voltage at 20 and 40 volts using the external voltmeter; adjust this trimmer so that the internal voltmeter reads 10 and 20 volts respectively.

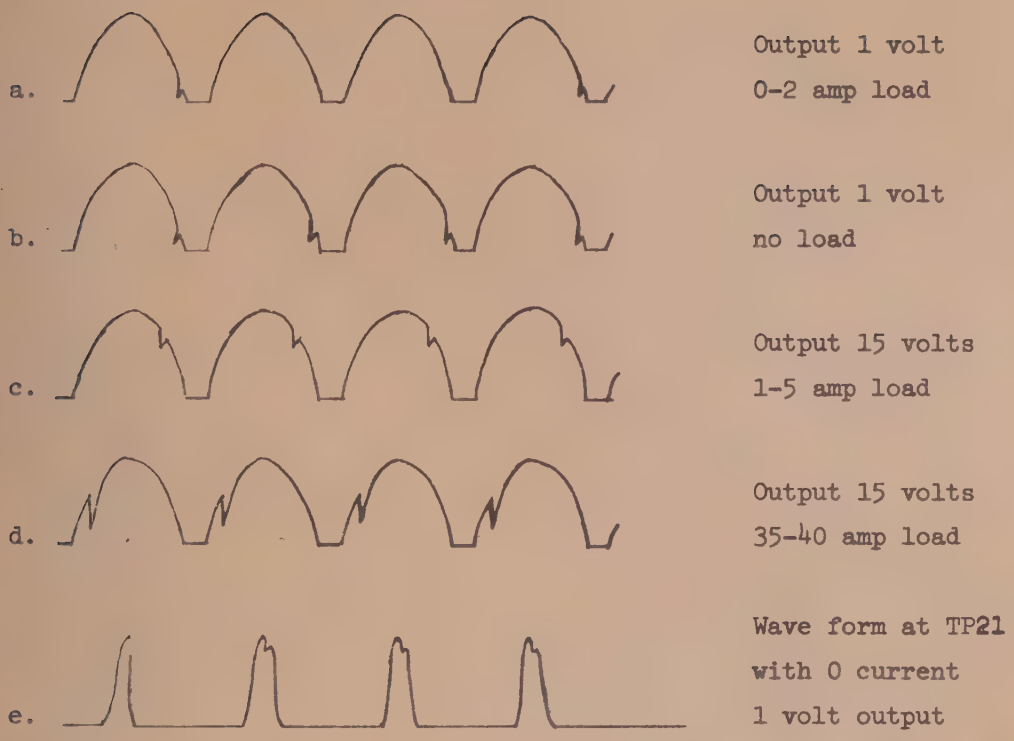


FIG 1

6.3 CURRENT LIMITER ADJUSTMENT

After performing the ammeter adjustment checks in 5.1, the power supply ammeter may be used to set the current limiter. Connect a load capable of drawing at least 4.5 amps across the small output jacks. Turn the current limiter control to the 40 amp position and turn the voltage control knob up until the maximum current is being drawn (do not exceed 5 amps). By adjusting trimmer (-37A) the upper current limit is set at 4.2 amps. Turn the current limit control knob down to 0 amps and adjust trimmer (-36D) until about 100 mA is being drawn by the load. Repeat these two adjustments until the range is adjusted for 100 mA to 4.2 amps. This also sets the 0-40 amp range.

PARTS LIST

NO	DESCRIPTION	QTY.
-1	Power transformer, Ratelco 2045	1
-2	Pulse transformer, Ratelco 1631B	1
-3	Diode, Tarzian F-6	2
-4	SCR, Syntron 35C10F	2
-5	Transistor, 2N3055	5
-6	Transistor, 2N3394	4
-7	Transistor, 2N4922	1
-8	Diode, 1N1186	2
-9	Transistor, 2N2646	1
-10	Diode, zener, 10V, 1W	2
-11	Diode, zener, 18V, 2W, 2VR18A	1
-12	Diode, zener, 24V, 1W, VR24A	1
-13	Capacitor, 22,000 mfd., 50V	1
-14	Capacitor, 1700 mfd., 100V	1
-15	Capacitor, 200 mfd., 15V	2
-16	Capacitor, 200 mfd., 15V	1
-17	Capacitor, 0.33 mfd., 100V	1
-18	Capacitor, 0.05 mfd., 1000V	3
-19	Capacitor, 0.05 mfd., 1000V	3
-20	Capacitor, 0.05 mfd., 1000V	3
-21	Resistor, 18K Ω, ½W, ±10%	1
-22	Resistor, 15K Ω, ½W, ±10%	1
-23	Resistor, 1.2K Ω, ½W, ±10%	2
-24	Resistor, 10K Ω, ½W, ±10%	1
-25	Resistor, 2.2K Ω, ½W, ±10%	3
-26	Resistor, 1.5K Ω, ½W, ±10%	2
-27	Resistor, 1[illegible] Ω, ½W, ±10%	2
-28	Resistor, [illegible]0 Ω, ½W, ±10%	1
-29	Resistor, 1 Ω, 1W, ±10% Type BWH	4
-30	Resistor, 500 Ω, 5W	2
-31	Resistor, 250 Ω, 20W	1
-32	Resistor, Nichrome wire, 13Ga., 10"	4
-33	Resister, Ratelco wire wound 0.28,4A	1
-34	Potentiometer, Clarostat A47-10K-W	1
-35	Resistor, 1K Ω, 5W	1

25-82554F19

48-82554F28
SUB. WITH M 9302

Ratelco INC.

DWN	AGG	KP	NAME D. C. POWER SUPPLY PS-8 (Motorola Model S-1305A)
DATE	2/25/69		
SHEET	1	4	2046

PARTS LIST

NO.	DESCRIPTION	QTY.
-36	Trimpot, 5K Ω, IRC X201R502B	6
-37	Trimpot, 1K Ω, IRC X201R102B	2
-38	Potentiometer, 500 Ω, 5W	1
-39	Circuit board, main, Ratelco	1
-40	Circuit board, meter, Ratelco	1
-41	Control head	1
-42	Fuse, Buss MDL 1	1
-43	Fuseholder, Buss HKP	1
-44	Pilot light ass'y, Omniglow 1010A3	1
-45	Fan, Granger 3M109, w/2C953 Blade	1
-46	Thermostat, Elmwood 2450-21-20	1
-47	Voltmeter, Hoyt 2025, 0-20VDC	1
-48	Ammeter, Hoyt 2025, 0-50ADC, Special	1
-49	Plug, Smith 285-102 red	1
-50	Plug, Smith 285-103 black	1
-51	Integrated circuit, Fairchild U5R7723393	1
-52	Switch, Carling 2FA53	1
-53	Feet, Smith 2194	4
-54	Jack, Smith 286-102 red	1
-55	Jack, Smith 286-103 black	1
-56	Binding post, 257 red	1
-57	Binding post, 257 black	1
-58	Power cord, Belden 17419	1
-59	Mounting bracket, capacitor, VR-12	1
-60	Heatsink, TOR 900, 7"	2
-61	Knob, Smith 2392	2
-62	Handle, Amerock A-459-26	2
-63	Frontplate, main	1
-64	Frontplate, control head	1
-65	Enclosure, Ratelco	1
-66	Cover	2
-67	Switch, Carling 1M250-73	1
-68	Capacitor, 1 mfd., 50V	2
-69	Resistor, 10K Ω, ½W, ±10%	1

Ratelco INC.

NO	DWN	CK
3 //	AGG	KP
DATE 6/20/69	DATE 2/25/69	

NAME: D. C. POWER SUPPLY PS-8 (Motorola Model S-1305A)

ST 2 SH 4 PART NO. 2046

PARTS LIST

NO	DESCRIPTION	QTY
-70	Diode, zener, [illegible], 1[illegible]0 mW	1
-71	Diode, zener, 5.6V, 1W	1
-72	[illegible], Tunnel [illegible]	1
-73	Resistor, 330 Ω, ½W, ±10%	1
-74	Resistor, 820 Ω, ½W, ±10%	1
-75	Resistor, 10K Ω, ½W, ±10%	1
-76	Thermostat, Elmwood 2450-21-153	1
-77	Connector, Elco 00-6007-010-940-002	1
-78	Connector, Elco 00-6007-015-940-002	1
-79	Resistor, 2.7K Ω, ½W, ±10%	1
-80	Lamp, 1847, Camd. base	1
-81	Lampholder, Johnson 147-620	1
-82	Spacer, Wakefield 106	4
-83	Capacitor bracket, VR-6	1
-84	Resistor, 1K Ω, ½W, ±10%	1

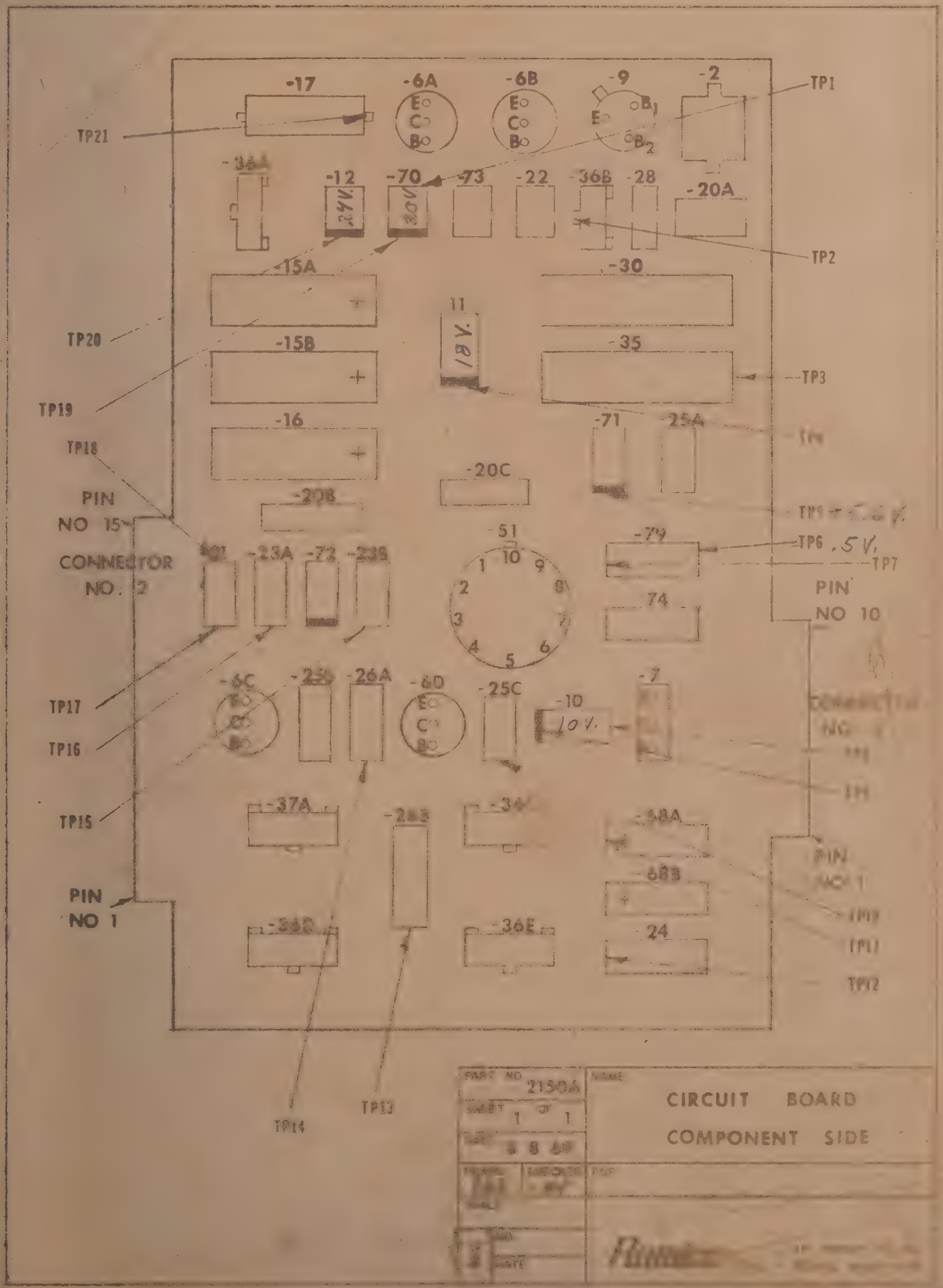
Ratelco INC. [illegible]

	//	ACG	KP
	2/10/69	2/25/69	

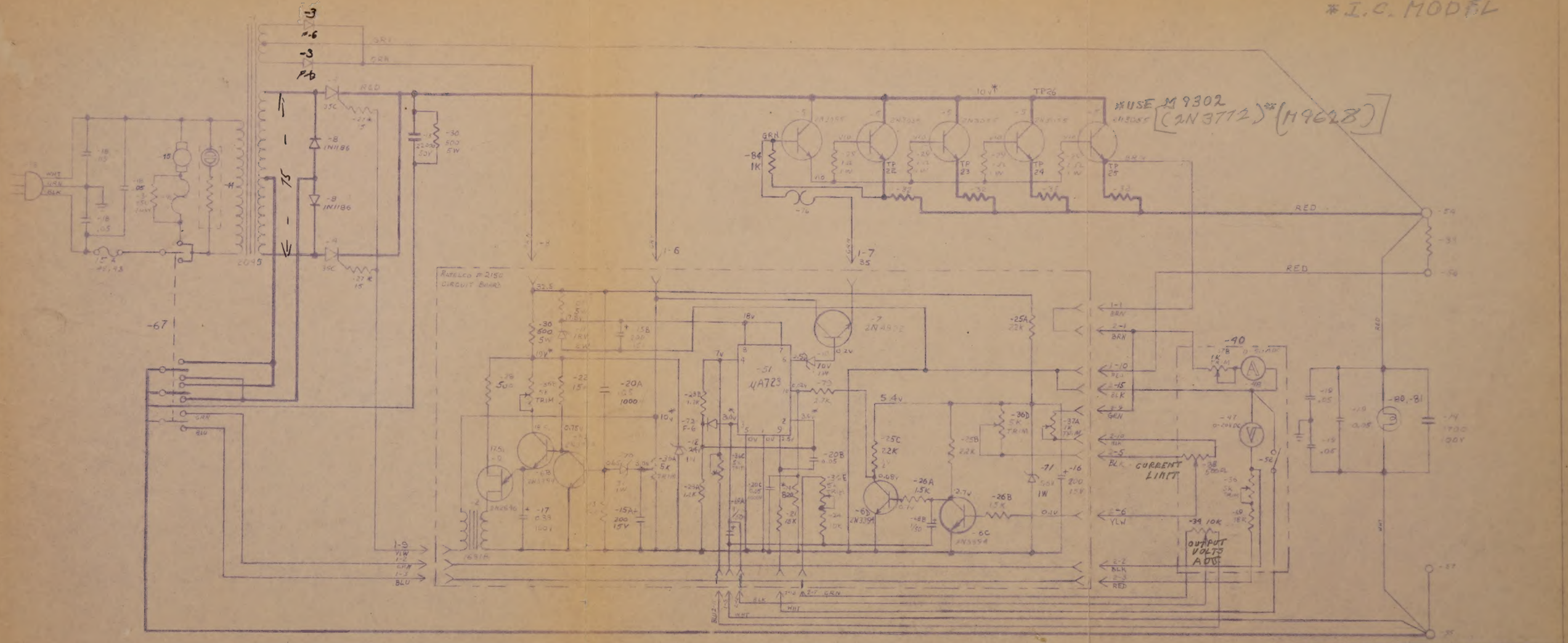
D. C. POWER SUPPLY PS-8

(Motorola Model S-1305A)

3 4 2046


-17
-6A
-6B
-9
-2
TP1
TP21
-36A
-12
-70
-73
-22
-36B
-28
-20A
TP2
-15A
-30
TP20
11
18 V.
-15B
-35
TP3
TP19
-16
-71
-25A
TP4
TP18
-20C
-20B
PIN
NO 15
CONNECTOR
NO. 2
-51
-79
TP6 .5 V.
TP7
-23A
-72
-23B
74
PIN
NO 10
-6C
-25B
-26A
-6D
-25C
-10
10 V.
-7
TP17
TP16
TP15
TP5
-37A
-24B
-34
-38A
-38B
PIN
NO 1
-38D
-36E
24
TP9
TP11
TP12
TP14
TP13
PART NO 2150A
SHEET 1 OF 1
NAME
CIRCUIT BOARD
COMPONENT SIDE

*I.C. MODEL



ALL VOLTAGES ± 10%
ALL CIRCUIT BOARD VOLTAGES MEASURED WITH STANDBY SWITCH IN STANDBY POSITION
VOLTAGE CONTROL AT 1 VOLT AND NEGATIVE VOLTMETER PROBE AT DC POSITIVE OUTPUT.
FAIRCHILD MODEL 7050 DIGITAL VOLTMETER, INPUT IMPEDANCE 1000 MEGOHM WAS USED FOR PRODUCTION MEASUREMENTS.
REVISION 6 APPLICABLE TO SETS WITH SERIAL NUMBER 131 AND ABOVE
REVISION 9 APPLICABLE TO SETS WITH SERIAL NUMBER 210 AND ABOVE

* VALUES MAY VARY WITH EACH UNIT

ALL RESISTORS ½ WATT UNLESS OTHERWISE NOTED

PART NO. 2046	NAME D.C POWER SUPPLY PS-8
SHEET 4 OF 4	MODEL: E-1305A
DATE 2/25/69	FOR MOTOROLA
DRAWN AGG / CHECKED	
SCALE	
NO. 11	Ratelco
10/9/69	

Ratelco, INC.

Founded in 1945 as Radio Telephone Service Company, RATELCO was the first Motorola 2-way radio service station in the United States. Today, the sale of parts and the servicing of mobile radio systems continue to be important functions of the corporation.

As the service business grew, founder Phil Duryee became aware of certain accessory items needed by RATELCO customers. Since these products were not then available commercially, Duryee, an electrical engineer, began designing and making the accessories himself. As more customers approached him with similar needs, it became evident these items could be manufactured and sold in quantity. Manufacturing facilities and personnel were added and RATELCO became a manufacturer as well as a service organization.

Others learned of RATELCO accessories and sought help in developing products to meet their special needs. Today RATELCO designs and manufactures such products as precision automatic battery chargers, high current DC power supplies, alternator power converters, cathodic protection controllers, mobile intercoms and communication antennas and accessories.

Ratelco facilities, housed in an 18,000 square foot building, include equipment for making chassis and enclosures, painting, baking, transformer winding, electronic assembly and testing. This gives maximum control over quality and delivery as well as flexibility for custom manufacturing.

A number of RATELCO designed products are manufactured as private label equipment for sale by major national firms.

RATELCO experience and facilities are available to you, too. Tell us your requirements. We look forward to working with you.

www.manualsplus.com
1035884

Ratelco, INC.

610 Pontius Avenue N. • Seattle, Washington 98109

Phone: AREA 206 - 624 - 7770